

Remarks/Arguments

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 28-33 are presently active in the application. Claims 1-27 have been canceled. Applicants reserve the right to file one or more divisional applications directed thereto. New Claims 28-33 have been added.

In the outstanding Office Action, the specification and drawings were objected to; Claim 1 was objected to; Claim 2 was rejected under 35 U.S.C. § 112, second paragraph; Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wright (U.S. Patent No. 5,841,468); Claims 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Wright as applied to Claim 1, and further in view of Pidgeon (U.S. Patent No. 5,153,763); and Claims 3, 6, and 8 were withdrawn from consideration.

The drawings and specification have been amended to correct the informalities noted in the Official Action.

Applicants acknowledge with appreciation the personal interview between Examiner Kim, Examiner Sedighian, and Applicants' representatives on January 19, 2005. At this interview, the language of Claims 1 and 2 was discussed in light of Wright, Pidgeon, and the election of Species 4 drawn to Figure 11. The Examiners acknowledged that the cited references do not describe a controller and they provided suggestions for amendments which would distinguish over the cited references. In particular, it was suggested that Claims 1 and 2 should be re-written for clarification and to read on the embodiment shown in Figure 11. Examiner Kim indicated that he would consider these differences with Applicants' response.

By way of background, television programs are broadcast in cable television systems (CATV) from a central head-end to a multitude of customers through a branching tree-like

Amendments to the Drawings

The attached sheets of drawings include changes to Figures 5, 6 and 7, correcting various numbers.

Attachments: Replacement Sheets (3).

optical fiber network. Amongst the broadcast channels, digital and analog television channels are carried on different bands. In addition, evolving services such as interactive television, voice over IP, and high speed internet are being carried bi-directionally through the CATV system. Since it is impractical to provide a separate fiber for each band of signals they are typically wavelength multiplexed. However, crosstalk between laser beams, i.e. imperfect separation, decreases signal to noise ratios. With at least this deficiency in mind the presently claimed invention is provided.

New Claim 28 recites, an optical apparatus comprising “a plurality of optical input paths; a plurality of optical output paths; a plurality of optical converters coupled between each of the optical input paths and each of the optical output paths; a controller coupled to the plurality of optical converters and configured to control an optical conversion of an optical input signal to an optical output signal, wherein the optical input signal and the optical output signal have a same information content; and the controller is configured to control the modulation frequency of each of the optical output signals.” Thereby, the presently claimed invention is capable of improving signal to noise metrics within an optical system by improving optical separation.

In addition, new dependent Claims 29 and 30 respectively recite the optical apparatus of Claim 28 wherein the controller is configured to control the “wavelength of the optical output signal” and “an interconnection of the optical input paths with the optical output paths.” Claims 31-33 alternatively recite a method for optical signal conversion. Support for the new claims is found in Applicants’ originally filed specification, and the elected species described in Figure 11.¹ Thus, no new matter is added.

¹ Specification, Figure 1; Figure 11; page 27 second full paragraph.; page 40 second full paragraph.

Wright describes a system and method for isolating data messages from subscribers in a CATV system by way of a fiber node having a receiver 52, a transmitter 50, and a plurality of transceivers 40 connected to an Ethernet switch 42. Wright also describes service sites 16 which couple service lines 18 to distribution hubs 14 through transmission cables 28 and receive cables 30, which “may all be fiber-optic cables or coaxial cables.”² However, as indicated during the interview, Wright does not describe or suggest a “a controller coupled to a plurality of optical converters and configured to control an optical conversion of an input optical signal to an output optical signal.”

In addition, Applicants assert that the Level 3 Ethernet switch described by and central to Wright will change the information content of the signals it receives as it shuffles and reroutes the different data packets from different sources. Moreover, Wright does not describe or suggest a plurality of input optical paths and a plurality of output optical paths. Despite the tangential remark in Wright that the system “may be all fiber-optic cables,” Wright describes only a single optical transmitter for an electrically stacked set of signals. Accordingly, there is no motivation for a person of ordinary skill in the art to modify Wright to obtain Applicants’ invention.

Pidgeon describes a CATV system configured to distribute cable TV signals from a head node to a plurality of consumer nodes. Further, a “broadband signal is obtained using combiners of the up converted TV signals and applied to an electro-optical transmitter 10 (EL/OPT-XMTR).”³ The Pidgeon Abstract describes the purpose of electrically stacking the signals:

In order to reduce distortion (second order distortion) which may be due to nonlinearities and interactions of signals in the transmitter, fiber and receiver, all or a portion of the spectrum which contains the lower channels is translated (block converted) to a frequency range which covers less than an octave.

² Wright, col. 5, ll. 52-54.

³ Pidgeon, col. 3, ll. 9-11.

However, the conversion described by Pidgeon is merely an electrical upconversion which is then applied to an optical transmitter. Pidgeon does not describe or suggest, as noted in the Official Action of June 15, 2004, Applicants' claimed optical converter. Nor does Pidgeon describe or suggest "a controller coupled to a plurality of optical converters and configured to control an optical conversion of an optical input signal to an optical output signal, wherein the optical input signal and the optical output signal have a same information content; and the controller is configured to control the modulation frequency of each of the optical output signals." Thus, Pidgeon does not cure the above noted deficiencies of Wright.

Therefore, Applicants submit that new independent Claims 28 and 31, and all claims depending therefrom, are not rendered obvious by the asserted prior art for at least the reasons stated above.⁴

⁴ MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Accordingly, in view of the present amendment and in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

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